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CARRIER BLACKMAN AND ASSOCIATES PC
22960 VENTURE DRIVE
SUITE 100
NOVI, MI 48375

EXAMINER
LAGUARDA, GONZALO

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wblackman@ameritech.net

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte KENJI NISHIDA, KAZUTO FUKUZAWA,
TETSUYA KANEKO, and KENJIRO SAITO

Appeal 2015-007144
Application 13/011,287
Technology Center 3700

Before NATHAN A. ENGELS, ERIC C. JESCHKE, and
PAUL J. KORNICZKY, *Administrative Patent Judges*.

JESCHKE, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Kenji Nishida et al. ("Appellants") seek review under 35 U.S.C. § 134(a) of the Examiner's decision, as set forth in the Final Office Action dated August 6, 2014 ("Final Act."), rejecting claims 1–20 under 35 U.S.C. § 103(a) as unpatentable over Obayashi (US 4,691,286, issued Sept. 1, 1987) and Bullis (US 4,463,729, issued Aug. 7, 1984).[1] We have jurisdiction under 35 U.S.C. § 6(b).

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[1] Appellants identify Honda Motor Co. Ltd. as the real party in interest. Br. 3.

We REVERSE and enter a NEW GROUND OF REJECTION under 37 C.F.R. § 41.50(b).

BACKGROUND

The disclosed subject matter "relates to an alcohol concentration estimation and detection apparatus for an engine." Spec. ¶ 2. Claims 1, 11, and 14 are independent. Claim 1 is reproduced below, with emphasis added:

> 1. An alcohol concentration estimation apparatus which receives a crank pulse supplied from a pickup coil which detects passing of a plurality of reluctors provided on a crank pulse rotor which rotates in synchronism with a crankshaft of an engine,
>
> said alcohol concentration estimation apparatus comprising:
>
> an NeA calculation section adapted to calculate an average engine speed (NeA) of the engine based on crank pulse output;
>
> and a $\Delta\omega 1$, $\Delta\omega 2$ calculation section operable:
>
> *to calculate a first crank angular speed ($\omega 1$) within a first predetermined interval ($\tau 1$) overlapping with a compression top dead center (TDC) of the engine,*
>
> *and to subtract the first crank angular speed ($\omega 1$) from the average engine speed (NeA) to calculate a first variation amount ($\Delta\omega 1$) and to calculate a second crank angular speed ($\omega 2$) within a second predetermined interval ($\tau 2$) overlapping with a combustion bottom*

> *dead center (BDC) of the engine and to subtract the first crank angular speed (ω1) from the second crank angular speed to calculate a second variation amount (Δω2)*;
>
> wherein said alcohol concentration estimation apparatus is operable to estimate an alcohol concentration of a fuel based on the values of the first variation amount (Δω1) and the second variation amount (Δω2).

DISCUSSION

Each of independent claims 1, 11, and 14 recites a "Δω1, Δω2 calculation section operable" to perform certain recited mathematical calculations. Br. 23, 27, 28–29 (Claims App.).[2] Regarding these limitations (including the recited calculations), the Examiner relied on Obayashi, column 6, line 54 to column 7, line 8 and column 7, line 15. Final Act. 2–3, 9–10, 12–13.[3] For each independent claim, the Examiner stated:

> Where Obayashi does not meet the precise mathematical calculations of the claim, it would have been obvious to one having ordinary skill in the art to have used known mathematical formulas to calculate combustion irregularity using engine speed measurements. Also, the apparatus of Obayashi and the application both have the same structure and feed the controller with same information to produce the same output of a combustion variation, so without evidence of special results

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[2] The calculations recited in claim 1 are shown with emphasis above. For claim 11, the two clauses following "a Δω1, Δω2 calculation section operable to calculate" set forth the calculations. Br. 27 (Claims App.). For claim 14, the two clauses following "a Δω1, Δω2 calculation section operable" set forth the calculations. *Id.* at 28–29.

[3] For claim 11, the Examiner also specifically cited Obayashi, column 6, lines 60 and 61. Final Act. 10.

> coming from the specified formula used it is understood that Obayashi is equivalent.

Id. at 3 (addressing claim 1), 10 (addressing claim 11 and stating "equivalent structure" rather than "the same structure"), 14 (addressing claim 14).

Appellants argue that the Examiner "acknowledge[s] that the claims recite a different mathematical technique as compared to the disclosure" in Obayashi but "ignores the differences and makes an unsupported allegation that the difference would have been obvious." Br. 18.

Here, the Examiner has not provided sufficient explanation of the findings and conclusions regarding the "$\Delta\omega 1$, $\Delta\omega 2$ calculation section" limitations (including the recited calculations) in each of the independent claims to present a prima facie case of obviousness. We agree with Appellants that the Examiner's statements that "it would have been obvious to one having ordinary skill in the art to have used known mathematical formulas to calculate combustion irregularity using engine speed measurements" lack record support. Final Act. 3, 10, 14. For example, the Examiner has not shown that the recited calculations in the limitations at issue were "known mathematical formulas." *See id.*

As to the statement that "without evidence of special results coming from the specified formula used it is understood that Obayashi is equivalent" (*id.*), the Examiner has not shown that the *equivalence* of the recited calculations to the calculations in Obayashi—even if assumed—would support a prima facie case of obviousness.

For these reasons, we do not sustain the rejection of independent claims 1, 11, and 14, or the rejection of dependent claims 2–10, 12, 13, and 15–20 under 35 U.S.C. § 103(a) as unpatentable over Obayashi and Bullis.

NEW GROUND OF REJECTION

We enter a new ground of rejection of claims 1–20 under 35 U.S.C. § 101 as directed to patent-ineligible subject matter.

The Supreme Court has set forth "a framework for distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of those concepts." *Alice Corp. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2355 (2014) (citing *Mayo Collaborative Servs. v. Prometheus Labs, Inc.*, 132 S. Ct. 1289, 1294 (2012)). Under that framework, we first "determine whether the claims at issue are directed to one of those patent-ineligible concepts"—i.e., a law of nature, a natural phenomenon, or an abstract idea. *Id.* (citing *Mayo*, 132 S. Ct. at 1296–97). If so, we secondly "consider the elements of each claim both individually and 'as an ordered combination' to determine whether the additional elements 'transform the nature of the claim' into a patent-eligible application." *Id.* (quoting *Mayo*, 132 S. Ct. at 1298, 1297). The Supreme Court has described the second step of the analysis as "a search for an 'inventive concept'—i.e., an element or combination of elements that is 'sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [ineligible concept] itself.'" *Id.* (alteration in original) (quoting *Mayo*, 132 S. Ct. at 1294).

Claim 1 is directed to an "alcohol estimation apparatus" that "receives a crank pulse" and includes two "calculation section[s]" that perform certain mathematical calculations. Br. 23 (Claims App.). Claim 11 is directed to an "alcohol concentration estimation apparatus" that "receives a crank pulse" and includes one "calculation section" that performs certain mathematical calculations. *Id.* at 27. Claim 14 is directed to an "alcohol concentration

estimation apparatus" that includes: (1) "a crank pulse detector operable to receive a crank pulse;" (2) three "calculation section[s]" that perform certain mathematical calculations; (3) "a fuel injection map set so as to operate the engine" in a certain manner; and (4) an "alcohol concentration derivation section" that performs certain mathematical calculations. *Id.* at 28–29.

We determine, under the first step of the analysis, that each of independent claims 1, 11, and 14 is directed to the abstract idea of receiving data and—using recited algorithms—generating additional data.[4] Our reviewing courts have held claims ineligible under § 101 when directed to manipulating existing information—using algorithms—to generate additional information. *See Parker v. Flook*, 437 U.S. 584, 585, 594–96 (1978) (rejecting as ineligible claims directed to (1) measuring the current value for a variable in a catalytic conversion process, (2) using an algorithm to calculate an updated "alarm-limit value" for that variable, and (3) updating the limit with the new value); *Gottschalk v. Benson*, 409 U.S. 63, 71–72 (1972) (rejecting as ineligible claims directed to an algorithm for converting binary-coded decimal numerals into pure binary form); *Elec. Power Grp. v. Alstom S.A.*, 830 F.3d 1350, 1353–54 (Fed. Cir. 2016) (discussing how "collecting information" and "analyzing information by steps people go through in their minds, or by mathematical algorithms, without more" are abstract ideas); *Digitech Image Techs., LLC v. Elecs. for*

[4] Although the claims here recite the algorithms in words rather than as mathematical formulas, the claims nevertheless recite algorithms. *See In re Grams*, 888 F.2d 835, 837 n.1 (Fed. Cir. 1989) ("It is of no moment that the algorithm is not expressed in terms of a mathematical formula. Words used in a claim operating on data to solve a problem can serve the same purpose as a formula.").

Imaging, Inc., 758 F.3d 1344, 1351 (Fed. Cir. 2014) ("Without additional limitations, a process that employs mathematical algorithms to manipulate existing information to generate additional information is not patent eligible."); *see also Intellectual Ventures I LLC v. Capital One Fin. Corp.*, No. 2016-1077, 2017 WL 900031, at *5–6 (Fed. Cir. Mar. 7, 2017) (determining that a claim reciting "an apparatus for manipulating XML documents" was directed to an abstract idea).

Turning to the second step of the analysis, we determine that the additional elements of claims 1, 11, and 14, individually and as ordered combinations, do not transform the nature of the independent claims into patent-eligible subject matter.

We first address certain claim language ostensibly limiting the use of the "apparatus" to estimating the alcohol concentration of a fuel used by an engine. *See, e.g.*, Br. 23, 27 (claims 1 and 11 reciting "wherein said alcohol concentration estimation apparatus is operable to estimate an alcohol concentration of a fuel based on the values of the first variation amount ($\Delta\omega 1$) and the second variation amount ($\Delta\omega 2$)"). Attempting to limit the use of an abstract idea to a particular technological environment does not render claims 1 and 11 patent eligible because the limitations at issue do not mitigate preemption concerns (*see Alice*, 134 S. Ct. at 2358) and does not transform the claims into patent-eligible applications of the abstract idea (*see Elec. Power*, 830 F.3d at 1354).

We next address the term "apparatus," which is recited in each of the independent claims. We determine that this term does not add anything that transforms the nature of the claims from an abstract idea into a patent-eligible invention because, for the reasons discussed below, the "apparatus"

recited is nothing more than a general-purpose computer. And as the Supreme Court has explained, "the mere recitation of a generic computer cannot transform a patent-ineligible abstract idea into a patent-eligible invention." *Alice*, 134 S. Ct. at 2358 ("Stating an abstract idea 'while adding the words "apply it"' is not enough for patent eligibility." (quoting *Mayo*, 132 S. Ct. at 1294)). The Specification here shows that the "apparatus" is an electronic control unit (ECU). *See* Spec. ¶¶ 15, 19, 20, 24 (identifying the alcohol concentration estimation and detection apparatus of various aspects of the "present invention" as element 30); ¶¶ 37, 52, 53, 56 (discussing ECU 30). This view is supported by Appellants' statements on appeal. *See* Br. 5, 9, 11 (identifying the "alcohol concentration estimation apparatus" in each claim as element 30). Moreover, the Specification does not indicate that the ECU is anything other than a general-purpose computer with "sections" that perform certain calculations. *See, e.g.*, Spec. ¶ 37 (introducing "ECU 30"), ¶¶ 55, 57, 64–66 (discussing the "sections" of ECU 30); ¶ 101 ("It may be noted that the . . . the internal configuration of the ECU or the like are not limited to that of the embodiment described hereinabove, but allows various alterations.").

We next address the recitation, in claim 14, of "a fuel injection map set so as to operate the engine" in a certain manner. *See* Br. 29 (Claims App.). This language does not affect our conclusion regarding step two. The recited "map" is disclosed as a data structure relating certain variables. *See* Spec. ¶ 86 ("FIG. 11 illustrates a fuel injection map set such that the engine is operated at a stoichiometric air fuel ratio where it is operated with a fuel of a predetermined alcohol concentration, and fuel injection time Ti corresponding to an engine speed Ne is determined from a plurality of

curved lines set for individual throttle openings Th."); Fig. 11. The presence of an intangible data structure in the "apparatus" of claim 14 does not transform the nature of the claim into patent-eligible subject matter. *See, e.g.*, *Digitech Image*, 758 F.3d at 1349 (discussing how claims "directed to information in its non-tangible form" "do[] not fall within any of the categories of eligible subject matter under section 101"); *see also Intellectual Ventures*, 2017 WL 900031, at *6 ("Although these data structures add a degree of particularity to the claims, the underlying concept embodied by the limitations merely encompasses the abstract idea itself of organizing, displaying, and manipulating data of particular documents.").

Thus, having determined that independent claims 1, 11, and 14 are directed to abstract ideas and that the claim elements, individually and as an ordered combination, do not transform the claims into patent-eligible subject matter, we reject claims 1, 11, and 14 under 35 U.S.C. § 101. We also reject dependent claims 2–10, 12, 13, and 15–20, which merely provide further limitations to various aspects previously addressed. Specifically, the dependent claims recite: (1) additional *sections* that perform calculations (claim 2); (2) additional *maps* or *map groups* (or further limitations on the data in *maps* or *map groups* previously recited) (claims 2, 3, and 15); (3) further limitations on the mathematical calculations (claims 2–6, 12, and 15–17); and (4) further limitations on the nature of the data received (claims 7–10, 13 and 18–20). For the same reasons discussed above, these further limitations are insufficient to transform the nature of claims 2–10, 12, 13, and 15–20 into patent-eligible subject matter.

DECISION

We REVERSE the decision to reject claims 1–20 under 35 U.S.C. § 103(a).

We enter a NEW GROUND OF REJECTION of claims 1–20 under 35 U.S.C. § 101 as directed to patent-ineligible subject matter.

FINALITY OF DECISION

This decision contains a new ground of rejection pursuant to 37 C.F.R. § 41.50(b). Section 41.50(b) provides "[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review." Section 41.50(b) also provides:

> When the Board enters such a non-final decision, the appellant, within two months from the date of the decision, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:
>
> (1) *Reopen prosecution*. Submit an appropriate amendment of the claims so rejected or new Evidence relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the prosecution will be remanded to the examiner. The new ground of rejection is binding upon the examiner unless an amendment or new Evidence not previously of Record is made which, in the opinion of the examiner, overcomes the new ground of rejection designated in the decision. Should the examiner reject the claims, appellant may again appeal to the Board pursuant to this subpart.
>
> (2) *Request rehearing*. Request that the proceeding be reheard under § 41.52 by the Board upon the same Record. The request for rehearing must address any new ground of rejection and state with particularity the points believed to have been misapprehended or overlooked in entering the new ground of rejection and also state all other grounds upon which rehearing is sought.

Further guidance on responding to a new ground of rejection can be found in the Manual of Patent Examining Procedure § 1214.01.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

REVERSED; 37 C.F.R. § 41.50(b)